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09/929,367	08/15/2001	Tomoyuki Yorinaga	067183-0192	8853

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EXAMINER	
MERED, HABTE	

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/929,367	YORINAGA ET AL.	
	Examiner	Art Unit	
	Habte Mered	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed on 28 June 2005 has been entered and fully considered.

2. Claims 1-9 are currently pending.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-3 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoogenboom et al (US Pub. No. 2002/0054568), hereinafter referred to as Hoogenboom, in view of Robotham et al (US 6, 775, 293), hereinafter referred to as Robotham, and Carr et al (US 6, 642, 293) et al, hereinafter referred to as Carr.

Hoogenboom discloses an ATM switch with rate limiting congestion control.

5. Regarding **claim 1**, Hoogenboom discloses An ATM switch **(Figure 1)**, comprising: one or more input side circuit interfaces **(Figure 2, element 210; Figure 4, element 420; Figure 5, element 520; Paragraph 24:Lines 1-15)**; one or more output side circuit interfaces **(Figure 2, element 220; Figure 4, element 430; Figure 3, element 320; Paragraph 25)**; and an ATM core switch for outputting cells inputted thereto from the input side circuit interface or interfaces to the output side circuit interface or interfaces **(Paragraph 2, Lines 1-6; Paragraph 13, Paragraph 24, Last line)**; each of the output side circuit interfaces feeding back a cell number accumulated

for each virtual channel to a corresponding one of the input side circuit interfaces **(Hoogenboom shows in Paragraph 26 has an accumulator for each virtual connection keeping track of the total cell count for the virtual connection. Based on the total cell count of each virtual connection a feedback to the input side is sent. See Paragraph 28, Lines 1-10; Paragraph 34, Lines 12-20 and signal 525 in Figure 5)**; each of the input side circuit interfaces shaping the rate of cells based on the feedback from a corresponding one of the output side circuit interfaces so that a peak cell rate total value of virtual channels which belong to a virtual path may not exceed a peak cell rate of the virtual path **(Hoogenboom shows in Figure 5 for each input side circuit interface a rate filter 570 with input control 560 with output feedback 525 shaping the cell rate. See Paragraph 34 too. Hoogenboom further discloses in Paragraph 24 the rate limitation policy based.)**; each of the output side circuit interfaces controlling, based on the cell number accumulated for each virtual channel, so that the peak cell rate of the virtual path to which the virtual channels belong may not exceed the peak cell rate total value of the virtual channels which belong to the virtual path. **(Hoogenboom shows in Figure 3 for each output side a rate-filter 360 and output control 360 and further in Paragraph 26 he shows that for each virtual connection total cell count is maintained and based on the count rate limitation is enforced by the rate-filter.)**

Hoogenboom fails to disclose a buffering arrangement where the output sends a total cell count of each virtual connection to the corresponding input side for congestion monitoring.

Robotham teaches a method an apparatus for monitoring buffer contents a data communication system.

Robotham discloses a buffering arrangement where the output sends a total cell count of each virtual connection to the corresponding input side for congestion monitoring. **(Robotham teaches in Figure 1 buffer arrangements that can be used in an ATM switch on either the input or output side. Column 2, Lines 64-67. Robotham shows an arrangement where a context table 30 is provided for identifying the different connections that will be sending cells. These connections or streams are identified by their VCI and VPI info. For each VP and the subset of VCs, a count of total number of cells is kept at all times in table 40. A separate congestion monitoring entity has an access to this table and based on threshold table 70 preventive actions are taken. Column 3, Lines 4-6 and 18-22; Column 5, Lines 1-5 and 14-26. Therefore, it is obvious that for one ordinarily skilled in the art that Robotham's congestion monitoring entity and threshold can be separated as indicated in Column 5, Lines 1-2 and can be placed on the input side of a switch. Under such arrangement the monitoring entity has to access the information in the count table and this can only be achieved if the output sends the data to the input side which would be obvious to one ordinarily skilled in the art.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hoogenboom's apparatus to incorporate a buffering system that provided sending total cell count for each VC to the input side.

Hoogenboom discusses in Paragraph 28 accumulating cell counts and monitors it for different combinations but does not disclose what these combinations are and how they are identified and accumulated and the relationship to the monitoring entity in the output control. Robotham discloses in Column 3, Lines 4-6 what these combinations can be and in Column 5, Lines 14-26 the relationship to the monitoring entity is further disclosed. Robotham in Column 5, lines 1-2 just like Hoogenboom's invention is governed by the monitoring of the buffer based on a connection basis.

Hoogenboom fails to disclose that the rate limitation on the input and output side is based on a peak cell rate total value of virtual channels which belong to a virtual path may not exceed a peak cell rate of the virtual path.

Carr teaches joint VC level shaping and VP level shaping.

Carr discloses that the rate limitation on the input and output side is based on a peak cell rate total value of virtual channels which belong to a virtual path may not exceed a peak cell rate of the virtual path. **(Carr shows in Figure 3 and Figure 4 VP shaping. Carr provides inter VP and intra VP shaping as shown in Figure 4. The shaping can be based on Peak Cell Rate as indicated in Column 4, Line 43. Certainly the VP shaper task is to enforce the peak cell rate total value of virtual channels which belong to a virtual path may not exceed the peak cell rate of the virtual path.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hoogenboom's apparatus to incorporate VP shaping.

Hoogenboom in Paragraph 29 indicates rate limitation should be based on policy and Carr provides a traffic policy based VP shaping.

6. Regarding **claim 2**, Hoogenboom discloses an ATM switch, wherein each of the input side circuit interfaces includes a physical layer processing section which terminates a cell **(Paragraph 2)**, and an input virtual channel cell rate control section for receiving the cell terminated by the physical layer processing section and controlling the rate of cell for each virtual channel **(Figure 5, element 520)** based on the feedback **(Figure 5, element 525)**. **(See Figure 5 and Paragraph 31)**

7. Regarding **claim 3**, Hoogenboom discloses an ATM switch, wherein each of the output side circuit interfaces **(Figure 3)** includes an output virtual channel cell rate control section **(Figure 3, elements 350 and 360)** for storing a cell number accumulated for each virtual channel **(Column 3, Lines 1-7, Paragraph 26)**, an output virtual path cell rate control section for controlling the cell rate for each virtual channel based on the cell number accumulated in the output virtual channel cell rate control section **(Figure 3, elements 350 and 360)**, and a physical layer section for outputting a cell from the output virtual channel cell rate control section to a circuit **(Figure 3, element 330)**, and the output virtual channel cell rate control section with a feeding back **(Figure 5, element 525)**. **(See also Paragraphs 25 and 26)**

Hoogenboom fails to disclose a buffering arrangement where the output sends a total cell count of each virtual connection to the corresponding input side for congestion monitoring.

Robotham teaches a method an apparatus for monitoring buffer contents a data communication system.

Robotham discloses a buffering arrangement where the output sends a total cell count of each virtual connection to the corresponding input side for congestion monitoring. **(Robotham teaches in Figure 1 buffer arrangements that can be used in an ATM switch on either the input or output side. Column 2, Lines 64-67. Robotham shows an arrangement where a context table 30 is provided for identifying the different connections that will be sending cells. These connections or streams are identified by their VCI and VPI info. For each VP and the subset of VCs, a count of total number of cells is kept at all times in table 40. A separate congestion monitoring entity has an access to this table and based on threshold table 70 preventive actions are taken. Column 3, Lines 4-6 and 18-22; Column 5, Lines 1-5 and 14-26. Therefore, it is obvious that for one ordinarily skilled in the art that Robotham's congestion monitoring entity and threshold can be separated as indicated in Column 5, Lines 1-2 and can be placed on the input side of a switch. Under such arrangement the monitoring entity has to access the information in the count table and this can only be achieved if the output sends the data to the input side which would be obvious to one ordinarily skilled in the art.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hoogenboom's apparatus to incorporate a buffering system that provided sending total cell count for each VC to the input side.

Hoogenboom discusses in Paragraph 28 accumulating cell counts and monitors it for different combinations but does not disclose what these combinations are and how they are identified and accumulated and the relationship to the monitoring entity in the output control. Robotham discloses in Column 3, Lines 4-6 what these combinations can be and in Column 5, Lines 14-26 the relationship to the monitoring entity is further disclosed. Robotham in Column 5, lines 1-2 just like Hoogenboom's invention is governed by the monitoring of the buffer based on a connection basis.

8. Regarding **claim 7**, Hoogenboom discloses a switch **(Figure 1)** comprising: an input processing section **(Figure 2, element 210; Figure 4, element 420; Figure 5, element 520; Paragraph 24:Lines 1-15)** configured to: receive cells via a plurality of virtual channels (VCs) of a virtual path (VP) **(Paragraph 2, Lines 1-6; Paragraph 13, Paragraph 24, Last line)**, and output, cells for each VC at a rate equal to or higher than a minimum cell rate based on a control signal **(Hoogenboom shows in Figure 3 for each output side a rate-filter 360 and output control 360 and further in Paragraph 26 he shows that for each virtual connection total cell count is maintained and based on the count rate limitation is enforced by the rate-filter. Hoogenboom also shows in Paragraph 26 has an accumulator for each virtual connection keeping track of the total cell count for the virtual connection. Based on the total cell count of each virtual connection a feedback to the input side is sent. See Paragraph 28, Lines 1-10; Paragraph 34, Lines 12-20 and signal 525 in Figure 5)**;; and an output processing section **(Figure 2, element 220; Figure 4, element 430; Figure 3, element 320; Paragraph 25)**configured to: store the cells from the input

processing section for each VC, determine a number of stored cells for each VC, generate the control signal, transmit the control signal to the input section, determine a number of stored cells for the VP(**Hoogenboom shows in Paragraph 26 has an accumulator for each virtual connection keeping track of the total cell count for the virtual connection. Based on the total cell count of each virtual connection a feedback to the input side is sent. See Paragraph 28, Lines 1-10; Paragraph 34, Lines 12-20 and signal 525 in Figure 5)**.

Hoogenboom fails to disclose a buffering arrangement where the output sends a total cell count of each virtual connection to the corresponding input side for congestion monitoring.

Robotham discloses a buffering arrangement where the output sends a total cell count of each virtual connection to the corresponding input side for congestion monitoring. **(Robotham teaches in Figure 1 buffer arrangements that can be used in an ATM switch on either the input or output side. Column 2, Lines 64-67. Robotham shows an arrangement where a context table 30 is provided for identifying the different connections that will be sending cells. These connections or streams are identified by their VCI and VPI info. For each VP and the subset of VCs, a count of total number of cells is kept at all times in table 40. A separate congestion monitoring entity has an access to this table and based on threshold table 70 preventive actions are taken. Column 3, Lines 4-6 and 18-22; Column 5, Lines 1-5 and 14-26. Therefore, it is obvious that for one ordinarily skilled in the art that Robotham's congestion monitoring entity and threshold**

can be separated as indicated in Column 5, Lines 1-2 and can be placed on the input side of a switch. Under such arrangement the monitoring entity has to access the information in the count table and this can only be achieved if the output sends the data to the input side which would be obvious to one ordinarily skilled in the art.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hoogenboom's apparatus to incorporate a buffering system that provided sending total cell count for each VC to the input side. Hoogenboom discusses in Paragraph 28 accumulating cell counts and monitors it for different combinations but does not disclose what these combinations are and how they are identified and accumulated and the relationship to the monitoring entity in the output control. Robotham discloses in Column 3, Lines 4-6 what these combinations can be and in Column 5, Lines 14-26 the relationship to the monitoring entity is further disclosed. Robotham in Column 5, lines 1-2 just like Hoogenboom's invention is governed by the monitoring of the buffer based on a connection basis.

Hoogenboom also fails to disclose that shaping a transmission of the cells from the output processing section based on a peak cell rate of the VP.

Carr discloses that the rate limitation on the input and output side is based on a peak cell rate total value of virtual channels which belong to a virtual path may not exceed a peak cell rate of the virtual path. **(Carr shows in Figure 3 and Figure 4 VP shaping. Carr provides inter VP and intra VP shaping as shown in Figure 4. The shaping can be based on Peak Cell Rate as indicated in Column 4, Line 43.**

Certainly the VP shaper task is to enforce the peak cell rate total value of virtual channels which belong to a virtual path may not exceed the peak cell rate of the virtual path.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hoogenboom's apparatus to incorporate VP shaping. Hoogenboom in Paragraph 29 indicates rate limitation should be based on policy and Carr provides a traffic policy based VP shaping.

9. **Claims 4 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoogenboom in view of Robotham and Carr as applied to claim 1 above, and further in view of Fukano et al (US 6, 775, 287), hereinafter referred to as Fukano.

The combination of Hoogenboom and Robotham teaches all aspects of the claimed invention as set forth in the rejection of claims 1 and 7 but does not disclose output buffer type switching with cell multiplex circuit.

Fukano disclose an ATM switch, wherein the ATM core switch includes multiplexing means for multiplexing cells from all of the output side circuit interface sections, filter means for comparing output port identification numbers applied to the cells with output port numbers of the filter means themselves and passing there through only those cells which exhibit coincidence in the comparison, and a cell buffer of the first-in first-out type provided for each output port for temporarily storing those cells which have passed through the corresponding filter means, converting the rate of the cells and outputting the resulting cells to a corresponding one of the output side circuit

interfaces. **(See Figure 1 and Column 1, Lines 43-67; Figure 3 and Column 5, Lines 25-50)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus that resulted from the combined invention of Hoogenboom and Robotham by using an output buffer type switching with cell multiplex circuit, the motivation being to add multicast functionality and make the ATM switch both unicast and multicast.

10. **Claims 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoogenboom in view of Robotham and Carr as applied to claim 1 above, and further in view of Endo et al (US 6, 275, 494), hereinafter referred to as Endo.

11. Regarding **claim 5**, the combination of Hoogenboom and Robotham teaches all aspects of the claimed invention as set forth in the rejection of claim 2 but does not disclose an ATM switch, wherein the input cell rate control section stores an input circuit number, a service class, a minimum cell rate, an output switch port number and an intra-switch connection identification number of contents of a contract concluded in advance in a corresponding relationship to a virtual path identifier/virtual channel identifier of an input cell.

Endo discloses an ATM switch, wherein the input cell rate control section stores an input circuit number, a service class, a minimum cell rate, an output switch port number and an intra-switch connection identification number of contents of a contract concluded in advance in a corresponding relationship to a virtual path identifier/virtual channel identifier of an input cell. **(Endo shows in Figure 5 a header conversion**

table for an input processor. The output interface number is the destination output switch number. The input circuit number is shown in Fig. 13 and can easily be retrieved with knowledge of VPI and VCI. The Applicant has not shown any unique advantage in storing these entities in the routing table. Certainly the VCs have a QoS defined by a minimum and peak cell rate, which is initially agreed in a Service Level Agreement and should be stored in a database or table. The advantage of storing an intra-switch connection identification along with these items is not established and is merely taken as a design decision.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus that resulted from the combined invention of Hoogenboom and Robotham by the input controller storing parameters like the output interface number in a header conversion table, the motivation being Hoogenboom in Paragraph 2 discusses how cells arriving at an input port are switched to an output port and Endo how the cells are processed at the input to determine the destination port.

12. Regarding **claim 6**, the combination of Hoogenboom and Robotham teaches all aspects of the claimed invention as set forth in the rejection of claim 3 but does not disclose an ATM switch, wherein the output virtual channel cell rate control section stores a service class, a virtual channel minimum cell rate, a virtual channel peak cell rate, a virtual path peak cell rate, an output circuit number and an output virtual path identifier/virtual channel identifier of contents of a contract concluded in advance in a corresponding relationship to an intra-switch connection identification number of each cell.

Endo discloses an ATM switch, wherein the output virtual channel cell rate control section stores a service class, a virtual channel minimum cell rate, a virtual channel peak cell rate, a virtual path peak cell rate, an output circuit number and an output virtual path identifier/virtual channel identifier of contents of a contract concluded in advance in a corresponding relationship to an intra-switch connection identification number of each cell. (**Endo shows in Figure 12 what an ATM output port controller can store that includes output interface number and output VPI. It is clear to one ordinarily skilled in the art that an ATM switch that uses policy based traffic shaping will have to store in a table various thresholds as indicated earlier by Robotham once during provisioning.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus that resulted from the combined invention of Hoogenboom and Robotham by the output controller storing parameters like PCR for VCs and VPs, the motivation being Hoogenboom has indicated in Paragraph 29 that traffic rate limitation can be policy based like Carr's VP shaping policy based on PCR as indicated in Column 4, Line 43.

13. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoogenboom in view of Robotham and Carr as applied to claim 7 above, and further in view of Watanbe (US 5, 771, 231).

Watanbe discloses an ATM exchange useful in an ATM network.

The combination of Hoogenboom and Robotham teaches all aspects of the claimed invention as set forth in the rejection of claim 7 but does not disclose a switch

wherein the input processing section is further configured to: associate, with each received cell, an intra-switch identification number, and wherein the output processing section being further configured to: identify connection information for each cell based on the intra-switch identification number associated with each cell.

Watanbe discloses a switch wherein the input processing section is further configured to: associate, with each received cell, an intra-switch identification number, and wherein the output processing section being further configured to: identify connection information for each cell based on the intra-switch identification number associated with each cell. **(See Figure 3 and Figure 4 and Column 9, Lines 45-65)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus that resulted from the combined invention of Hoogenboom and Robotham by allowing the use of intra-switch id in the form of tag, the motivation being the apparatus of both Hoogenboom and Robotham are ATM switches and switches normally route internally by adding headers or tag.

Response to Arguments

14. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HM
09-19-2005

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